



Selected papers presented at the conference on
**DESALINATION STRATEGIES IN
SOUTH MEDITERRANEAN COUNTRIES**
Cooperation between Mediterranean countries of Europe
and the southern rim of the Mediterranean

September 11–13, 2000

Contents

Desalination, Volume 136

Introduction

M.J. Safi (Tunis, Tunisia) and M. Balaban (L'Aquila, Italy)	1
<i>Distillation plant development and cost update</i>	
N.M. Wade (Brighton, UK)	3
<i>Desalination coupled with salinity-gradient solar ponds</i>	
H. Lu, J.C. Walton and A.H.P. Swift (El Paso, TX, USA)	13
<i>Les ressources en eau en Algérie: stratégies, enjeux et vision</i>	
A. Kettab (Algiers, Algeria)	25
<i>Retrospective et perspectives du dessalement en Algérie</i>	
S. Kehal (Algiers, Algeria)	35
<i>Desalination experience in Morocco</i>	
K. Tahri (Rabat, Morocco)	43
<i>Recent developments in water desalination</i>	
S.P. Bindra and W. Abosh (Tripoli, Libya)	49
<i>Potable water technology development in Egypt</i>	
E.E. Khalil (Cairo, Egypt)	57
<i>Desalination in Egypt and the future application in supplementary irrigation</i>	
M. El-Kady and F. El-Shibini (Fum Ismailiya Canal, Egypt)	63
<i>Water supply and demand and a desalination option for Sinai, Egypt</i>	
M. Abou Rayan, B. Djebedjian and I. Khaled (El Mansoura, Egypt)	73
<i>Evaluation of non-conventional water resources supply in Jordan</i>	
J.O. Jaber and M.S. Mohsen (Zarqa, Jordan)	83
<i>Water crisis in Palestine</i>	
B.A.A. Abu Zahra (Palestine)	93

<i>Water management and desalination in Israel</i>	
N. Moatty (Tel Aviv, Israel)	101
<i>Middle East regional study on water supply and demand development</i>	
Ministry for Economic Cooperation and Development and German Agency for Technical Cooperation (Federal Republic of Germany)	105
<i>Emerging role of BOOT desalination projects</i>	
F. Lokiec and G. Kronenberg (Raanana, Israel)	109
<i>Maltese experience in the application of desalination technology</i>	
A. Riolo (Luga, Malta)	115
<i>The strategic position of desalination in the overall water policy of Cyprus</i>	
Y. Fessas (Nicosia, Cyprus)	125
<i>Distillation desalination systems powered by waste heat from combined cycle power generation units</i>	
T. Szacsvey and M. Posnansky (Bern, Switzerland)	133
<i>25 years of experience in operating thermal desalination plants</i>	
S.A. Kershman (Tripoli, Libya)	141
<i>Thermoeconomic optimization of a dual-purpose power and desalination plant</i>	
J. Uche, L. Serra and A. Valero (Zaragoza, Spain)	147
<i>Heat recovery from sulphuric acid plants for seawater desalination</i>	
A. Lovato, C. Legorreta and E. Andersson	159
<i>Forty-year design life: the next target — Material selection and operating conditions in thermal desalination plants</i>	
C. Sommariva, H. Hogg and K. Callister (Brighton, UK)	169
<i>A new formulation for the non-equilibrium allowance in MSF processes</i>	
P. Fiorini, E. Sciubba (Rome, Italy) and C. Sommariva (Brighton, UK)	177
<i>Low-temperature distillation processes in single- and dual-purpose plants</i>	
G. Kronenberg and F. Lokiec (Ra'anana, Israel)	189
<i>High-energy efficiency desalination project using a full titanium desalination unit and a solar pond as the heat supply</i>	
G. Caruso, A. Naviglio (Rome, Italy), P. Principi and E. Ruffini (Ancona, Italy)	199
<i>Perspectives of solar-assisted seawater distillation</i>	
L. García-Rodríguez and C. Gómez-Camacho (Canary Islands, Spain)	213
<i>Thermoeconomic optimization of the SOL-14 plant (Plataforma Solar de Almería, Spain)</i>	
L. García-Rodríguez, A.I. Palmero-Marrero (Canary Islands, Spain) and C. Gómez-Camacho (Seville, Spain)	219
<i>Analytical aspects of silica in saline waters: application to desalination of brackish waters</i>	
B. Hamrouni and M. Dhahbi (Tunis, Tunisia)	225
<i>Numerical and experimental analyses for RO desalination systems using a static pressure head</i>	
O. Miyatake and K. Tagawa (Fukuoka, Japan)	233
<i>Molar ratios as a useful tool for prediction of scaling potential inside RO systems</i>	
S. El-Manharawy and A. Hafez (Cairo, Egypt)	243
<i>Use of fluid instabilities to enhance membrane performance: a review</i>	
N. Al-Bastaki and A. Abbas (Isa Town, Bahrain)	255
<i>Performances de la station de dessalement de Gabes (22,500 m³/j) apres cinq ans de fonctionnement</i>	
K. Fethi and C. Habib (Gabes, Tunisia)	263

<i>Corrosion testing of platinum metals CVD coated titanium anodes in seawater-simulated solutions</i>	
I.K. Igumenov, N.V. Gelfond, P.S. Galkin, N.B. Morozova, N.E. Fedotova, G.I. Zharkova, V.I. Shipachev, E.F. Reznikova, A.D. Ryabtsev, N.P. Kotsupalo, V.I. Titarenko (Novosibirsk, Russia), Yu.P. Dikov, V.V. Distler and M.I. Buleev (Moscow, Russia)	273
<i>Performance decline in brackish water FilmTec spiral wound RO membranes</i>	
A. Abbas and N. Al-Bastaki (Isa Town, Bahrain)	281
<i>Y2K generation FILMTEC® RO membranes combined with new pretreatment techniques to treat raw water with high fouling potential: summary of experience</i>	
J.A. Redondo and I. Lomax (Rheinmünster, Germany)	287
<i>A methodology to investigate brackish groundwater desalination coupled with aquifer recharge by treated wastewater as an alternative strategy for water supply in Mediterranean areas</i>	
E. Georgopoulou, A. Kotronarou, A. Koussis (Athens, Greece), P.J. Restrepo (Boulder, CO, USA), A. Gómez-Gotor (Las Palmas, Grand Canary Islands, Spain) and J.J. Rodríguez Jimenez (Madrid, Spain)	307
<i>Cost comparison and efficiency modeling in the electrodialysis of brine</i>	
M. Demircioğlu, N. Kabay, E. Ersöz, I. Kurucavali, Ç. Şafak and N. Gizli (Izmir, Turkey)	317
<i>Pollution of nitrate in Moroccan groundwater. removal by electrodialysis</i>	
A. Elmidaoui, F. Elhannouni, M.A. Menkouchi Sahli, L. Chay (Kénitra, Morocco), H. Elabbassi, M. Hafsi (Rabat, Morocco) and D. Largeteau (Wissous, France)	325
<i>Set-up involving electrodialysis for production of drinking-quality water from artesian waters with salt content up to 8 kg/m³ with productivity up to 1 m³/h</i>	
A.D. Ryabtsev, N.P. Kotsupalo, V.I. Titarenko, I.K. Igumenov, N.V. Gelfond, N.E. Fedotova, N.B. Morozova and V.A. Shipachev (Novosibirsk, Russia)	333

Desalination, Volume 137

<i>Proving test for a solar-powered desalination system in Gaza–Palestine</i>	
M.S. Abu-Jabal (Gaza–Palestine), I. Kamiya and Y. Narasaki (Tokyo, Japan)	1
<i>Operation experience of a solar- and wind-powered desalination demonstration plant</i>	
D. Weiner, D. Fisher, E.J. Moses, B. Katz and G. Meron (Haifa, Israel)	7
<i>Effect of climatic conditions on the performance of a simple basin solar still: a comparative study</i>	
M. Boukar and A. Harmin (Adrar, Algeria)	15
<i>Solar thermal desalination system with heat recovery</i>	
K. Schwarzer, M.E. Vieira, C. Faber and C. Müller (Aachen, Germany)	23
<i>The performance of the capillary film solar still installed in South Algeria</i>	
B. Boucekima, (El Alia, Algeria), B. Gros (Toulouse, France), R. Ouahes and M. Diboun (El Alia, Algeria)	31
<i>Small reverse osmosis units using PV systems for water purification in rural places</i>	
A. Joyce, D. Loureiro, C. Rodrigues and S. Castro (Lisbon, Portugal)	39
<i>Siting assessment of a water–electricity cogeneration nuclear power plant in Egypt</i>	
A. Karameldin and S. Mekhemar (Cairo, Egypt)	45
<i>Study of a water desalination station using the SMCEC technique: dynamic modelling and simulation</i>	
H. Ben Bacha, T. Damak, M. Bouzguenda, A.Y. Maalej and H. Ben Dhia (Sfax, Tunisia)	53
<i>Design of a membrane facility for water potabilization and its application to Third World countries</i>	
J.M. Arnal Arnal, M. Sancho Fernández, G. Martín Verdú and J. Lora García (Valencia, Spain)	63

<i>Evaluation of membrane processes to reduce the salinity of reclaimed wastewater</i> Y. Harussi, D. Rom, N. Galil and R. Semiat (Haifa, Israel)	71
<i>A reverse osmosis potable water plant at Alicante University: first years of operation</i> D. Prats Rico and M.F. Chillón Arias (Alicante, Spain)	91
<i>Déminéralisation de l'eau Saumâtre du Forage Albien "Ain Sahara" pour l'alimentation en eau potable de la ville de Touggourt</i> S.M. Oussedik (Blida, Algeria)	103
<i>Electro-ultrafiltration d'une solution de BSA — Etude du coût</i> S.M. Oussedik (Blida, Algeria) and N. Mameri (Alger, Algeria)	113
<i>Spring water treatment with ultrafiltration and stripping</i> C. Cabassud (Toulouse, France), C. Burgaud and J.-M. Espenan (Fourquevaux, France)	123
<i>Elimination de la dureté et des sulfates contenus dans les eaux par nanofiltration</i> A.H. Bannoud (Aleppo, Syria)	133
<i>Assessing the linkage between feed water quality and reverse osmosis membrane performance</i> A. Bick (Beer Sheva, Israel) and G. Oron (Kiryat Sde Boker, Israel)	141
<i>Ambient energy for low-cost water desalination</i> G.S. Virk, M.G. Ford (Portsmouth, UK), B. Denness, A. Ridett and A. Hunter (Newport, UK)	149
<i>Transient characteristics and performance of a novel desalination system based on heat storage and spray flashing</i> O. Miyatake, Y. Koito, K. Tagawa and Y. Maruta (Fukuoka, Japan)	157
<i>Water desalination by humidification and dehumidification of air: state of the art</i> K. Bourouni (Tunis, Tunisia), M.T. Chaibi (Arlana, Tunisia) and L. Tadrist (Marseille, France)	167
<i>Role of hydrate phases of calcium carbonate on the scaling phenomenon</i> H. Elfil (Hammam-Lif, Tunisia) and H. Roques (Toulouse, France)	177
<i>Membrane processes for the recovery and reuse of wastewater in agriculture</i> A. Gómez Gotor, S.O. Pérez Baez, C. Argudo Espinoza and S. Ismail Bachir (Las Palmas, Grand Canary Islands, Spain)	187
<i>Membrane solution to a "significant risk" Cryptosporidium groundwater source</i> D. Edwards (Feading, UK), A. Donn and C. Meadowcroft (Whitchurch, UK)	193
<i>Characterizing an electrodialysis reversal pilot plant</i> R. Valerdi-Pérez, M. López-Rodríguez, J.A. Ibáñez-Mengual (Murcia, Spain)	199
<i>Development of a two-stage electrodialysis set-up for economical desalination of sea-type artesian and surface waters</i> A.D. Ryabtsev, N.P. Kotsupalo, V.I. Titarenko, I.K. Igumenov, N.V. Gelfond, N.E. Fedotova, N.B. Morozova, V.A. Shipachev and A.S. Tibilov (Novosibirsk, Russia)	207
<i>Le déficit d'eau en Algérie: une situation alarmante</i> R. Hadeff and A. Hadeff (Oum El Bouaghi, Algeria)	215
<i>Evaluation comparative d'un projet de cogénération pour la production d'électricité et d'eau douce pour la Tunisie</i> M. Chelbi, L. Ghedira (Monastir, Tunisia) and S. Allal (Saint-Quentin en Yvelines, France)	219
<i>Optimisation de la consommation énergétique dans la station de dessalement de Zarzis (12,000 m³/j)</i> K. Fethi (Gabès, Tunisia)	225
<i>Anaerobic digestion treatment of olive mill wastewater for effluent re-use in irrigation</i> I.P. Marques (Lisbon, Spain)	233
<i>Removal of chromate anions by micellar-enhanced ultrafiltration using cation surfactants</i> L. Gzara and M. Dhahbi (Hammam-Lif, Tunisia)	241
<i>Exergy analysis of the SOL-14 plant (Plataforma Solar de Almería, Spain)</i> L. García-Rodríguez (Tenerife, Canary Islands, Spain) and C. Gómez-Camacho (Seville, Spain)	251

Economic analysis of wind-powered desalination

- L. García-Rodríguez, V. Romero-Ternero (Tenerife, Canary Islands, Spain) and
C. Gómez-Camacho (Seville, Spain) 259

Desalination of brines by membrane distillation

- L. Martínez-Díez and F.J. Florido-Díaz (Málaga, Spain) 267

Thermodynamic description of saline waters prediction of scaling limits in desalination processes

- B. Hamrouni (Tunis, Tunisia) and M. Dhahbi (Hammam-Lif, Tunisia) 275

A small PV-driven reverse osmosis desalination plant on the island of Gran Canaria

- D. Herold and A. Neskakis (Jülich, Germany) 285

Projet de dessalement de l'eau de mer à El Bibane

- A. Ounalti (Tunis, Tunisia) 293

Déminéralisation des eaux saumâtres de Brédéah dans la région du bassin hydrographique

Oranie–Chott–Chergui. Partie I : Hydrogéologie de la nappe de Brédéah

- B. Dahmani (Tlemcen, Algeria) and C. Bithorel (Paris, France) 297



